Poster III-30

Integrating Diffusion, T1, and T2-Weighted MRI Images Into Composite Color Representations

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MR Imaging uses many different pulse sequences. Some of the most commonly used are the Diffusion-weighted, T1-weighted, and T2-weighted pulse sequences. Each mode is unique with respect to the information it provides about the object being studied. Of considerable importance, different tissues sometime appear to have similar gray scale values in a particular mode, but may be easier to differentiate in another mode. Accurate clinical analysis of magnetic resonance images requires the ability to integrate the information obtained from these different pulse sequences. One way to visualize all three pulse sequence modalities simultaneously is by integrating all three of the images into a single composite RGB colored image. MRI data sets of a Carnegie Stage 18 embryo acquired in Diffusion, T1, and T2 weighting were analyzed. We converted each of the gray scale images from the three pulse sequence modalities into a separate color image. These images were then fused into a single composite RGB image. The composite image that is generated from this procedure incorporates all of the information from the different MRI weightings instead of just one weighting. This allows for better visual differentiation between tissues. Furthermore, the user can interactively alter the colors and intensities assigned to each image type, and accentuate different structures. We have developed a program in MATLAB that facilitates the multivariate analysis of magnetic resonance data sets. This integrative approach to complex biological data sets has potential educational, clinical and research applications.